

1.0 INTRODUCTION

The National Nuclear Security Administration (NNSA) Y-12 Site Office proposes to replace the existing coal fired boiler steam plant at the Y-12 National Security Complex (Y-12 Complex) with a new centralized steam plant using natural gas fired, packaged boiler systems as part of the Steam Plant Life Extension (SPLE) Project - Steam Plant Replacement (SPR) Subproject. The NNSA is preparing this environmental assessment (EA) as part of the decision-making process to assess potential environmental impacts of the project in accordance with the *National Environmental Policy Act* (NEPA) of 1969 and the U.S. Department of Energy (DOE) NEPA Implementing Procedures (10 Code of Federal Regulations [CFR] Part 1021).

1.1 Purpose and Need for Action

Purpose of the Action. The purpose of the proposed action is to ensure a long term source of steam production at the Y-12 Complex. NNSA proposes to utilize skid mounted gas fired boilers as an alternative to extending the life of the existing Y-12 Steam Plant. This action would require a new building, several package boilers, water treatment units, and a minimum of two fuel oil storage tanks. The skid mounted package boiler concept would be a long term solution, scalable to the Y-12 Complex existing and future energy requirements.

Need for the Action. The existing Y-12 Steam Plant has been operating continuously since its construction in 1954. A service life extension upgrade completed in the mid-1980s was projected to extend the life of three of the four boilers (boilers 1, 2, and 4) and supporting auxiliaries to approximately 2010. Boiler 3 was not upgraded, and the existing Y-12 Steam Plant has undergone no significant modifications or upgrades since the previous life extension program. For the Y-12 Complex to continue to meet its mission, the existing steam-generating capability must be replaced or restored to a condition that will provide a reliable, cost-effective source of steam to the Y-12 Complex.

The purpose of the SPLE Project – SPR Subproject is to replace the existing coal fired boiler Y-12 Steam Plant with a new centralized steam plant using natural gas fired, packaged boiler systems. Selection of the long-term source for steam production at the Y-12 Complex is necessary in order to continue reliable operations and directly support the recommendation of the December 2001 Nuclear Posture Review to revitalize the defense infrastructure, increase

confidence in the deployed forces, eliminate unneeded weapons, and mitigate the risks of technological surprise. The SPLE Project – SPR Subproject directly contributes to the DOE Strategic Plan's Defense Strategic Goal: To protect our national security by applying advanced science and nuclear technology to the Nation's defense. It also supports achievement of DOE General Goal 1 of Nuclear Weapons Stewardship: Ensure our nuclear weapons continue to serve their essential deterrence role by maintaining and enhancing the safety, security and reliability of the U.S. nuclear weapons stockpile. The SPLE Project – SPR Subproject will directly contribute to the safety and reliability of one of the nation's most sensitive nuclear weapons sites.

Reliable and cost-effective steam generation is vital to the operation of the Y-12 Complex. It is the primary source of building heat for personal comfort and it provides freeze protection for critical services that include fire protection systems and heat tracing of exterior above ground water systems. Steam is also necessary to support the production mission that includes regeneration of dehumidification systems and operation of steam-powered ejectors in the wet chemistry operations of Enriched Uranium Operations. The existing Y-12 Steam Plant also provides steam condensate and treated water as feed water for the demineralized water plant.

1.2 Background

The existing Y-12 Steam Plant has been operating continuously since its construction in 1954. Service life extension upgrades were completed in the mid-1980s to extend the life of three of the four boilers and supporting auxiliaries to approximately 2010. In its current condition, the plant is approaching the end of its useful life. An inspection in fiscal year (FY) 2003 found boiler 4 to be in good condition. Boilers 1 and 2 have a history similar to that of boiler 4 and are judged to be in reasonable condition. Boiler 3 was permanently retired on June 12, 2006, and will not be restarted. Some components of the auxiliary equipment including the coal-handling system, feedwater system, forced-draft system, induced-draft system, ash-handling systems, and the plant control and electrical systems are in various states of deterioration and are deemed to be unreliable, technologically obsolete, and inefficient. Spare parts for many systems are not readily available.

The existing Y-12 Steam Plant consists of four Wickes boilers, each rated at a maximum steam output of 250,000 pounds/hour at 235 pounds per square inch gauge (psig). Pulverized coal,

natural gas, or a combination of these two fuels may be fired simultaneously in each boiler. Each boiler is equipped with a reverse air baghouse. Flue gas is exhausted from each boiler through a dedicated baghouse by an induced draft fan that discharges the flue gas to a stack. There are two stacks; one serves Boilers 1 and 2, and the other stack services Boilers 3 and 4.

Steam is distributed at 235 psig to the numerous demand points through the main headers. Steam condensate amounting to approximately 25 percent (in the summer) and 35 percent (in the winter) of the plant boiler feedwater is returned for reuse through a condensate return piping network. Most of the heating steam condensate return is used to supply the plant's demineralized water system located in Building 9404-18.

Boiler feedwater consists of treated water from the Oak Ridge Water Treatment Facility and condensate return from the steam distribution system. The water is processed through chemical softeners, degassifiers, deaerators, and other chemicals that are added as required to maintain proper pH and water chemistry.

Waste streams from the water softener beds regeneration, feedwater heat exchangers, and the steam plant's floor drains are pumped to the north partitioned section of the coal yard run off holding basin, which has a 124,000 gallon capacity. Waste streams from the boiler blowdown and ash hoppers are pumped into the concrete channel that surrounds the coal pile. The waste streams in this channel flow into the south section of the 373,000-gallon capacity holding basin. Waste water collected in the partitioned basin along with stormwater runoff from the coal pile is pumped to the Steam Plant Wastewater Treatment Facility for treatment. Existing Y-12 Steam Plant operating procedures require the treatment of the liquid waste at the Steam Plant Wastewater Treatment Facility to satisfy the City of Oak Ridge Industrial and Commercial User Waste Water Discharge Permit, 1-91, for direct discharge to the Y-12 Complex's sanitary sewer system.

1.3 Scope of EA Analysis

This EA conforms to the requirement of the Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508) implementing the NEPA and DOE Implementing Procedures (10 CFR 1021).

This EA is tiered from the Final Site-Wide Environmental Impact Statement (SWEIS) for the Y-12 National Security Complex (Y-12 SWEIS), DOE/EIS-0309. The No Action Alternative of the Y-12 SWEIS includes the continued implementation of planned modernization actions announced in the 2002 Record of Decision (ROD) as modified by subsequent actions, as well as new actions subsequent to the 2002 ROD that have undergone separate NEPA review. The following actions announced in the 2002 ROD, modifications to the actions of the 2002 ROD, and actions undertaken since the 2002 ROD are included in the No Action Alternative. The environmental conditions described in the Y-12 SWEIS reflect the baseline operational impacts of these missions for the foreseeable future. The Y-12 SWEIS also discusses operational impacts under the No Action Alternative, Proposed Action Alternative, and the Reduced Operations Alternative.

1.4 Public Involvement

No public meetings have been conducted for this EA. However, NNSA will provide the public an opportunity to review and comment on the EA, prior to the issuance of the Final EA. However, NNSA provided the public a public notice announcing the availability of the Draft EA, the length of the comment period, and where copies of the draft could be obtained was placed in local newspapers.